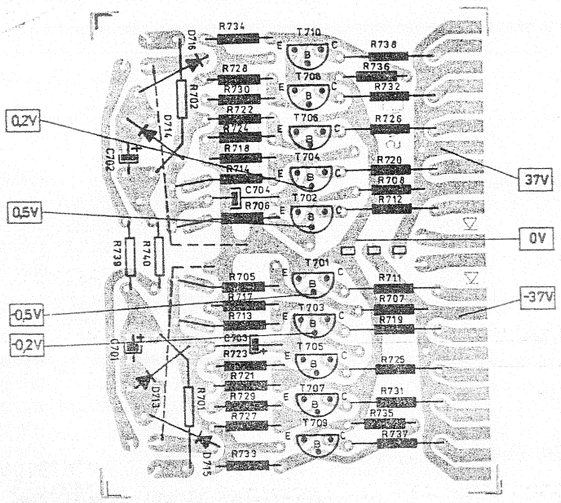
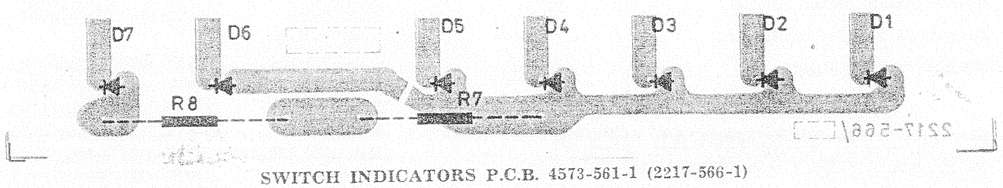
Crown

Hifi Stereo Amplifier

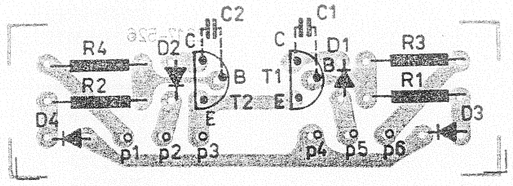
WS 440



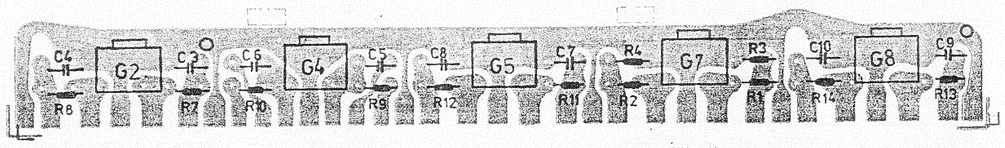
INDICATORS P.C.B. 4573-587-1 (2217-542-1)



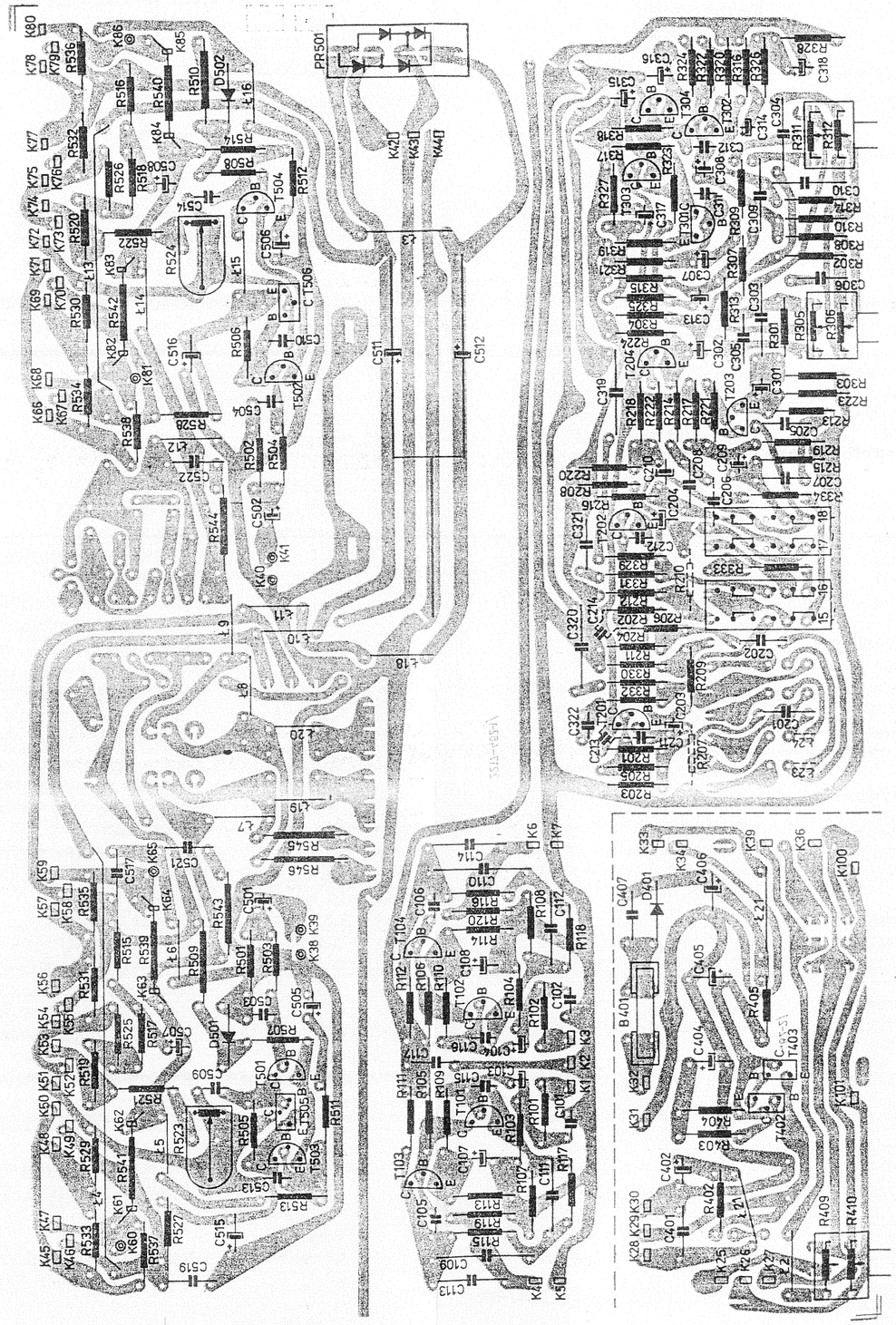
SWITCH INDICATORS P.C.B. 4573-561-1 (2217-566-1)



PROTECTION P.C.B. 4573-526-1 (2217-526-1)



INPUT SOCKETS P.C.B. 4573-549-2 (2217-556-1)



MAIN AMP. P.C.B. 4573-554-11 (2217-482-1/2)

C103, 104, 209, 210, 307, 308	04/U-1μF/63V
C203, 204, 301, 302, 313, 314, 315, 316	04/U-2.2μF/40V
C501, 502	04/U-4.7μF/25V
C507, 508	04/U-47μF/25V
C107, 108, 317 318, 505, 506	04/U-100μF/6.3V
C515, 516	04/U-220μF/40V
C(511+512)	02/T-S-B-2×4700μF/40V

Miscellaneous

—	Switch type PSP 1-2301

MAIN P.C.B. 4573-554-11 (2217-482-2)

Diodes

D401	BYP-401/200

Transistors

T402, 403	BD-137

Resistors

R405	RWW-0207-0-100Ω±10%
R402, 403	RWW-0207-0-1kΩ±10%
R404	RWW-0207-0-47kΩ±10%
R(409+410)	Potentiometer PRP-162 GC-2×47kΩ MN 30P-6

Capacitors

C407	MKSE-018-02-0.047μF±10%-250V
C401	MKSE-018-02-0.22μF±10%-100V
C402	04/U-47μF/63V
C404, 405, 406	04/U-220μF/63V

Miscellaneous

B401	Fuse T0.4A

INDICATORS P.C.B. 4573-587-1 (2217-542-1)

Diodes

D713, 714, 715, 716	AAP-120

Transistors

T701, 703, 705, 707, 709	BC-307A
T702, 704, 706, 708, 710	BC-237A

Resistors

R739, 740	RWW-0207-0-130Ω±10%
R735, 736	RWW-0207-0-270Ω±5%
R701, 702	RWW-0207-0-270Ω±10%
R729, 730	RWW-0207-0-1.8kΩ±5%
R723, 724	RWW-0207-0-4.7kΩ±10%
R705, 706, 713, 714, 721, 722, 727, 728, 733, 734	RWW-0207-0-5.6kΩ±5%
R717, 718	RWW-0207-0-47kΩ±10%
R707, 708	RWW-0207-0-620kΩ±5%
R711, 712, 719, 720, 725, 726, 731, 732, 737, 738	RWW-0617-0-2.2kΩ±10%

Capacitors

C701, 702, 703, 704	04/U-10μF/25V

SWITCH INDICATORS P.C.B. 4573-561-1 (2217-566-1)

Diodes

D1, 2, 3, 4, 5, 6, 7	CQV-36

Resistors

R7, 8	RWW-0617-0-4.7kΩ±10%

PROTECTION P.C.B. 4573-526-1 (2217-526-1)

Diodes

D801, 802, 901, 902	BAYP-94
D803, 804, 903, 904	BAYP-95

Transistors

T801, 901	BC-238
T802, 902	BC-308

Resistors

R803, 804, 903, 904	RWW-0207-0-200Ω±5%
R801, 802, 901, 902	RWW-0207-0-3kΩ±10%

Capacitors

C801, 802, 901, 902	KFPf-2F-10×10-22000pF-Z-25V

MISCELLANEOUS PARTS OUTSIDE THE P.C.B.

D703, 704, 705, 706, 707, 708, 709, 710, 711, 712	CQV-39
T507, 508	BD-135 gr. 10
T509, 510	BD-139
T511, 512	BD-140
T513, 514	BDP-395
T515, 516	BDP-396
C1, 2	MKSE-018-02-0.22μF±10%-100V
R5, 6	Potentiometer PRT-162 GC41-2×47kB-5-30P-6
—	Switch type PSP 1-8303
—	Mains switch 1×F — module — — NE18/2a-EE witch chassis
G10, 11	Input socket GW2-2 (CINCH)
G1, 3, 6, 9	Input socket GM-545-1 (DIN)
G12, 13, 14, 15	Loudspeaker socket 4569-041
G16, 17, 18	Mains socket 4562-047-1
G19	Headphones socket 4562-046-1
Tr 1	Transformer type TS-120/13
B1	Fuse T1.25A
—	Fuse holder GPa 250V/6.3A
V1, V2	Bulb type R5-24V/30mA
L1, 2	Drossel 3573-399-2
L3, 4, 5, 6	Drossel 3573-398-1
R17, 18, 19, 20	RWW-0414-0-10Ω±10%
R15, 16	RWW-0207-0-4.3kΩ±5%
C17, 18, 23, 24	MKSE-018-01-0.1μF±10%-250V
C11, 12	KCR-1B-U-3×8-39pF-K-500V
C13, 14, 19, 20	KFP-2B-5-470pF-M-160V
C25, 26	KFP-2E-5-1nF-S-250V
C15, 16, 21, 22	KFP-2E-3300pF-S-250V

INPUT SOCKETS P.C.B. 4573-549-2 (2217-556-1)

Resistors

R7÷R14	RWW-0207-0-4.3kΩ±5%
R1, 2, 3, 4	RWW-0207-0-1MΩ±10%

Capacitors

C5÷C10	KCPf-1B-P-6×6-47pF-K-25V
C3, 4	KCP-1F-W-8-100pF-K-160V

Miscellaneous

G2, 4, 5, 7, 8	Socket GW-2

CROWN® JAPAN WS-640

SERVICE MANUAL
HI FI STEREO AMPLIFIER

I. TECHNICAL SPECIFICATION

Output power (R=2×8 Ω):
RMS 2×50 W
Music 2×80 W

THD (2×35 W): 0.03%

Intermodulation distortion: 0.06%

Frequency response:
Linear: 15÷26000 Hz (±1.5 dB)
Phono: RIAA (±2 dB)

Channel separation (at 1 kHz): 60 dB

S/N ratio:
Linear: 104 dB
Phono: 100 dB

Inputs:
Linear: 190 mV (EMF)/47kΩ
Phono: 1.9 mV (EMF)/47kΩ

Power supply: 220 V — 50 Hz

Power consumption: 170 VA

Dimensions: 440×90×260 mm

Weight: approx. 8 kg

II. LIST OF ELECTRICAL PARTS
MAIN AMPLIFIER P.C.B. 4573-554-11 (2217-482-1)

Diodes

D501, 502	BZP-630 C8V2
	B80C5000/3300

Transistors

T101, 102, 301, 302	BC-413C
T103, 104	BC-414C
T201, 202	BC-414B
T203, 204, 303, 304	BC-237B
T501, 502, 503, 504	BC-307A
T505, 506	BD-139

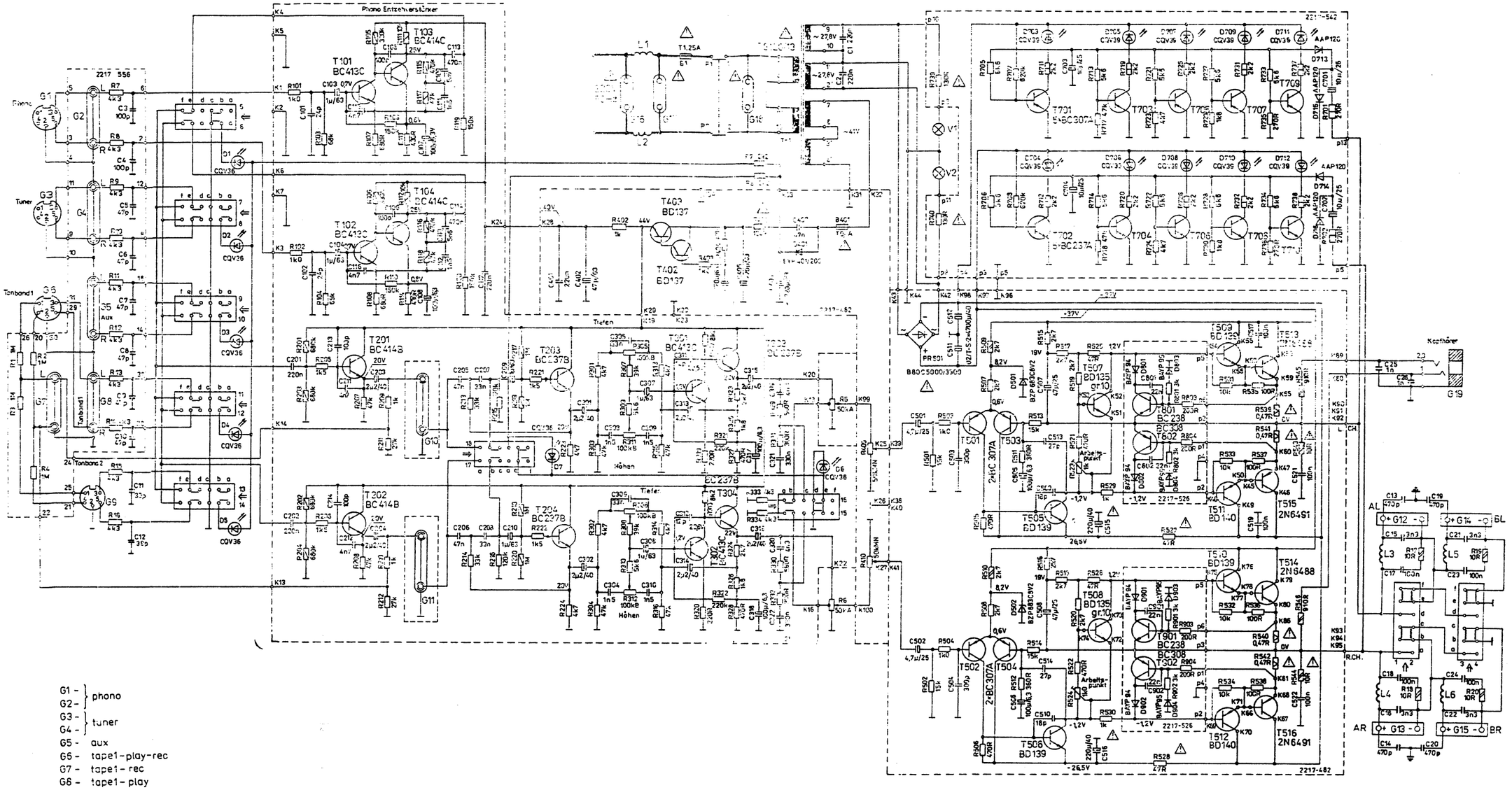
Resistors

R539, 540, 541, 542	Wire wound resistor 0.5 Ω acc. to fig. 3573-407-1
R543, 544	RWW-0414-0-10Ω±10%
R525, 526, 527, 528	RWW-0207-0-47Ω±10%
R535, 536, 537, 538	RWW-0207-0-100Ω±10%
R319, 320	RWW-0207-0-220Ω±10%
R231, 322	RWW-0207-0-300Ω±5%
R511, 512	RWW-0207-0-360Ω±5%
R113, 114	RWW-0207-0-430Ω±5%
R327, 328, 505, 506, 521, 522	RWW-0207-0-470Ω±10%
R329, 330	RWW-0207-0-560Ω±5%
R107, 108	RWW-0207-0-680Ω±5%
R545, 546	RWW-0414-0-910Ω±5%
R101, 102, 209, 210, 503, 504, 529, 530	RWW-0207-0-1kΩ±10%
R205, 206, 221, 222	RWW-0207-0-1.5kΩ±10%
R325, 326	RWW-0207-0-1.8kΩ±5%
R507, 508, 515, 516, 517, 518, 519, 520	RWW-0207-0-2.7kΩ±10%
R509, 510	RWW-0414-0-2.7kΩ±10%
R323, 324	RWW-0207-0-2.7kΩ±5%
R333, 334	RWW-0207-0-4.3kΩ±5%
R301, 302, 313, 314	RWW-0207-0-4.7kΩ±5%
R223, 224	RWW-0207-0-4.7kΩ±10%
R309, 310	RWW-0207-0-5.6kΩ±5%
R317, 318	RWW-0207-0-8.2kΩ±10%
R531, 532, 533, 534	RWW-0207-0-10kΩ±10%
R111, 112	RWW-0309-0-10kΩ±10%
R317, 318	RWW-0207-0-8.2kΩ±10%
R531, 532, 533, 534	RWW-0207-0-10kΩ±10%
R111, 112	RWW-0309-0-10kΩ±10%
R501, 502, 513, 514	RWW-0207-0-15kΩ±5%
R211, 212	RWW-0207-0-27kΩ±10%
R213, 214	RWW-0207-0-33kΩ±5%
R307, 308	RWW-0207-0-39kΩ±5%
R207, 208, 303, 304, 315, 316	RWW-0207-0-47kΩ±10%
R117, 118	RWW-0309-0-47kΩ±5%
R103, 104	RWW-0207-0-68kΩ±10%
R215, 216	RWW-0207-0-120kΩ±5%
R109, 110, 119, 120	RWW-0207-0-150kΩ±10%
R321, 322	RWW-0207-0-22kΩ±10%
R105, 106	RWC-0.125W-330kΩ±10%
R115, 116	RWC-0.125W-470kΩ±5%
R201, 202, 203, 204	RWC-0.125W-680kΩ±5%
R217, 218, 219, 220	RWC-0.125W-1MΩ±10%
R523, 524	Potentiometer TVP 1212 1 kΩ (semi-fixed)
R(305+306), (311+312)	Potentiometer PRP-162 GC-11-2×100kA 30P-6

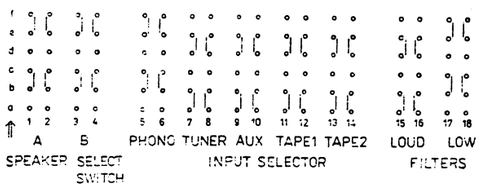
Capacitors

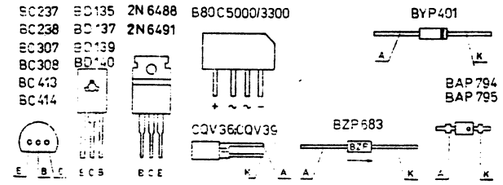
C311, 312	KCP-1B-U-5-12pF-K-400V
C509, 510	KCP-1B-P-6-18pF-J-160V
C101, 102	KCP-1B-P-6-24pF-J-160V
C513, 514	KCP-1B-P-6-27pF-K-160V
C105, 106, 213, 214	KCP-1F-W-8-100pF-K-160V
C503, 504	KCPf-1B-U-12-300pF-J-50V
C111, 112, 303, 304, 309, 310	KSF-020-1500pF±5%-160V
C319, 320	KSF-020-4300pF±5%-160V
C109, 110	KSF-020-5600pF±5%-63V
C115, 116, 211, 212, 215, 216	KFPf-2E-6×6-4.7nF-S-25V
C207, 208, 305, 306	MKSE-018-02-0.033μF±10%-250V
C205, 206	MKSE-018-02-0.047μF±10%-250V
C517, 519, 521, 522	MKSE-018-02-0.1μF±20%-100V
C117, 201, 202	MKSE-018-02-0.22μF±10%-100V
C321, 322	MKSE-018-02-0.33μF±10%-100V
C113, 114	MKSE-018-02-0.47μF±10%-100V

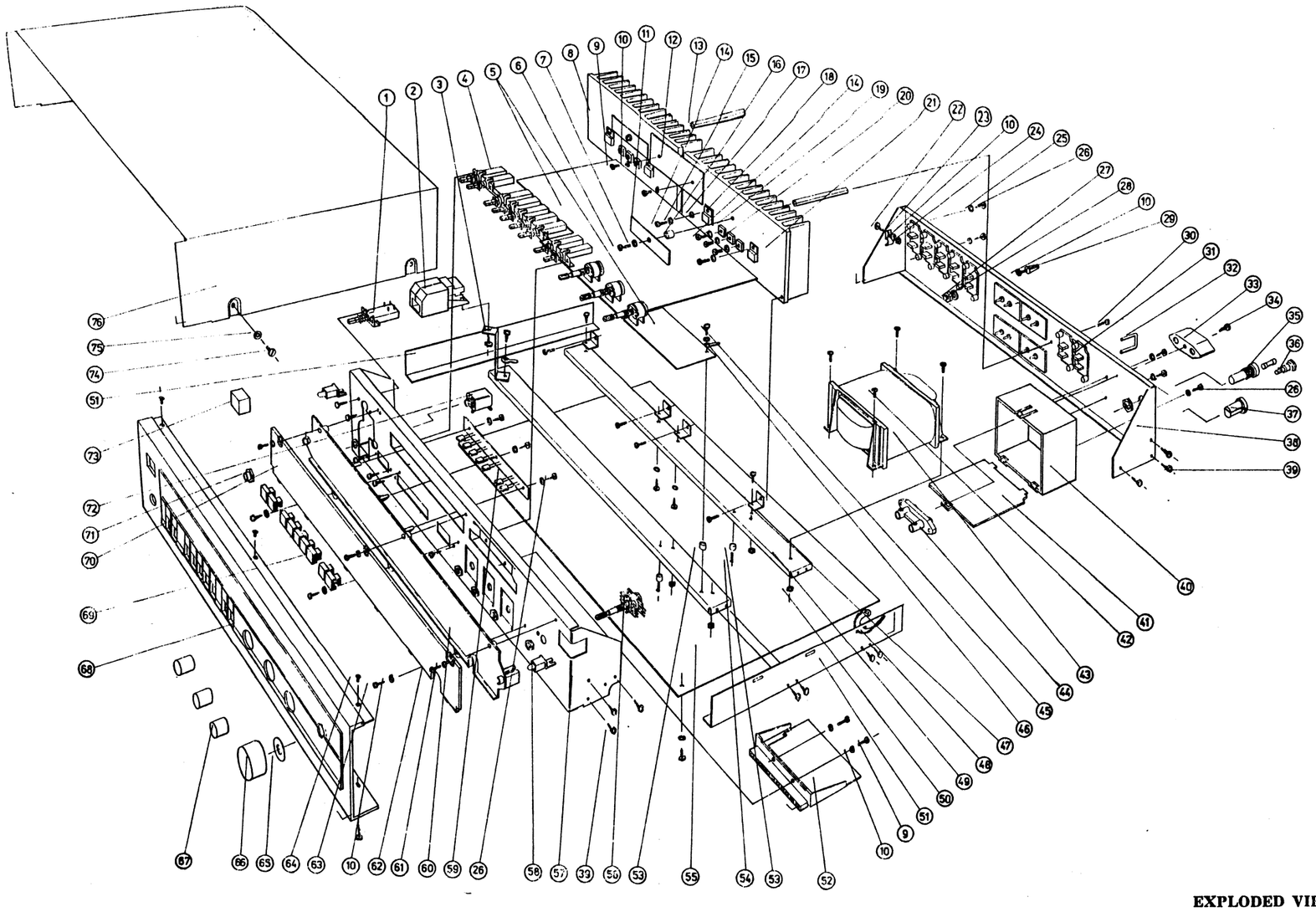
HI FI STEREO AMPLIFIER
CIRCUIT DIAGRAM



G1 - } phono
G2 - }
G3 - } tuner
G4 - }
G5 - aux
G6 - tape1 - play-rec
G7 - tape1 - rec
G8 - tape1 - play
G9 - tape2 - play-rec
G10 - equalizer - left channel
G11 - equalizer - right channel
G12 - specker A - left channel
G13 - speaker A - right channel
G14 - speaker B - left channel
G15 - speaker B - right channel
G16 - } AC outlets - unswitched
G17 - }
G18 - AC outlets - switched
G19 - headphones





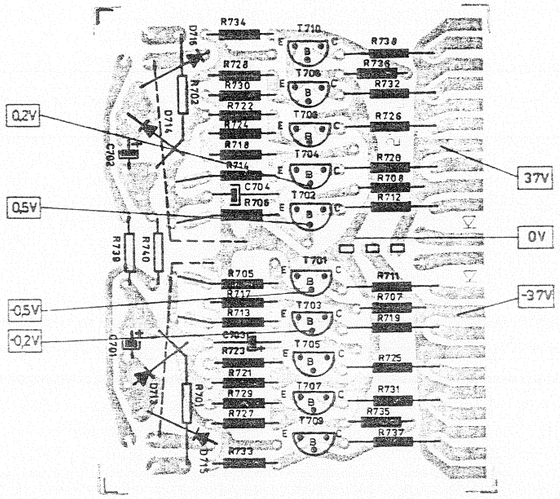


EXPLODED VIEW

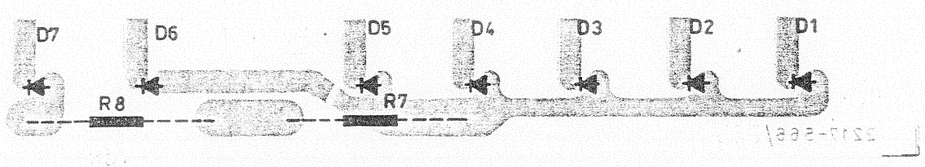
III. LIST OF MECHANICAL PARTS

NO	Description of Parts or Component	Part NO or Standard NO
1	Mains switch 1×F — module — NE18/2a-EE witch chassis	—
2	Swith cover	2775-067-1
3	Support	2633-219-1
4	Switch type PSP 1-8303	—
5	Main P.C.B.	4573-554-11
6	Screw M3×18-4.8-B-Z2	PN-85/M-82215
7	Washer 3.2-Z2	PN-82/M-82024
8	Heatsink	3771-275-1
9	Screw M3×10-4.8-B-Z2	PN-85/M-82215
10	Washer 3.2/8A-Z2	ZN-62/T6-4006
11	Protection P.C.B.	4573-526-1
12	Plate	2632-279-1
13	Bar	2674-014-1
14	Screw M2.5×10-4.8-A-Z2	PN-85/M-82215
15	Washer 2.7-Z2	PN-78/M-82007
16	Spacer washer 1/9	ZN-62/T6-4010
17	Spacer washer	1867-348-1
18	Mica insulator	1660-324-1
19	Washer A/PcFK/3.2/8	ZN-62/T6-4007
20	Mica insulator	1660-206-1
21	Heatsink	3771-275-2
22	Screw M3×8-4.8-B-Z2	PN-85/M-82215
23	Holder	2681-013-1
24	Nut M3-5-II-Z2	PN-75/M-82144
25	Washer 3.2-R1	PN-78/M-82007
26	Drive screw AGb 2.9×9.5-R1	PN-79/M-83106
27	Nut M6-5-II-Z2	PN-75/M-82144
28	Washer 6.4-Z2	PN-78/M-82007
29	Screw	1191-055-1
30	Screw M3×6-4.8-B-R1	PN-85/M-82215
31	Socket GW2-2	ZN-81/MPM-14/ZES-088
32	U joint	2685-023-1
33	Cover	2775-065-2
34	Screw M3×10-4.8-B-Z2	PN-85/M-82207
35, 36	Fuse holder GPa 250V/6.3A	—
37	Cord holder	2621-801-1
38	Rear panel	4787-118-11

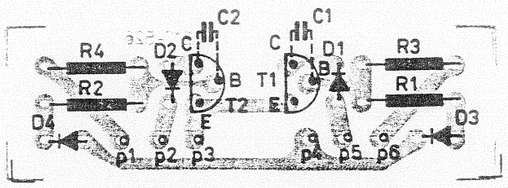
NO	Description of Parts or Component	Part NO or Standard NO
39	Drive screw B2.9×6.5-Z2	DIN-7976
40	Protecting cover	2775-086-1
41	Cover plate	2621-915-1
42	Screw M4×8-4.8-Z2	PN-85/M-82215
43	Transformer type TS-120/13	WT/D-4247-0433-01
44	Mains socket	4562-047-1
45	Drive screw B2.9×13-Z2	DIN-7976
46	Soldering lug	ZN-70/MPM-14/T15-086
47	Bracket	2633-182-1
48	Strip fastener	2621-247-1
49	Supporting bar	2641-054-1
50	Nut M4-5-II-Z2	PN-75/M-82144
51	Side bracket	2641-053-1
52	Indicators ass'y	4562-054-1
53	Spacer washer	1867-291-7
54	Screw M3×12-4.8-B-Z2	PN-85/M-82215
55	Bottom cover	4787-109-1
56	Potentiometer PRT-162 GC41-2×47kB-5-30P6	WT-82/L7-356
57	Front support	3771-220-3
58	Bulb holder	4567-027-1
59	Switch indicators P.C.B.	4573-561-1
60	Scale background	2621-977-1
61	Washer 3.2-Z2	PN-78/M-82007
62	Screw M3×14-4.8-B-Z2	PN-85/M-82215
63	Drive screw B2.9×9.5-Z2	DIN-7976
64	Screw M2.5×6-4.8-A-Z2	PN-85/M-82207
65	Slide washer	1660-211-7
66	Volume knob	4791-191-1
67	Knob	4791-189-3
68	Front panel	4771-248-1-02
69	Button	2846-355-2
70	Scale	2841-331-1-01
71	Nut	2621-756-3
72	Headphones socket	4562-046-1
73	Mains switch button	2621-724-9
74	Screw M3×8-4.8-B	PN-85/M-82207
75	Spacer washer	1867-423-2
76	Bonnet	2781-633-3



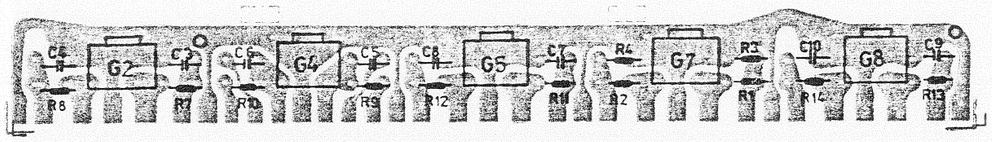
INDICATORS P.C.B. 4573-587-1 (2217-542-1)



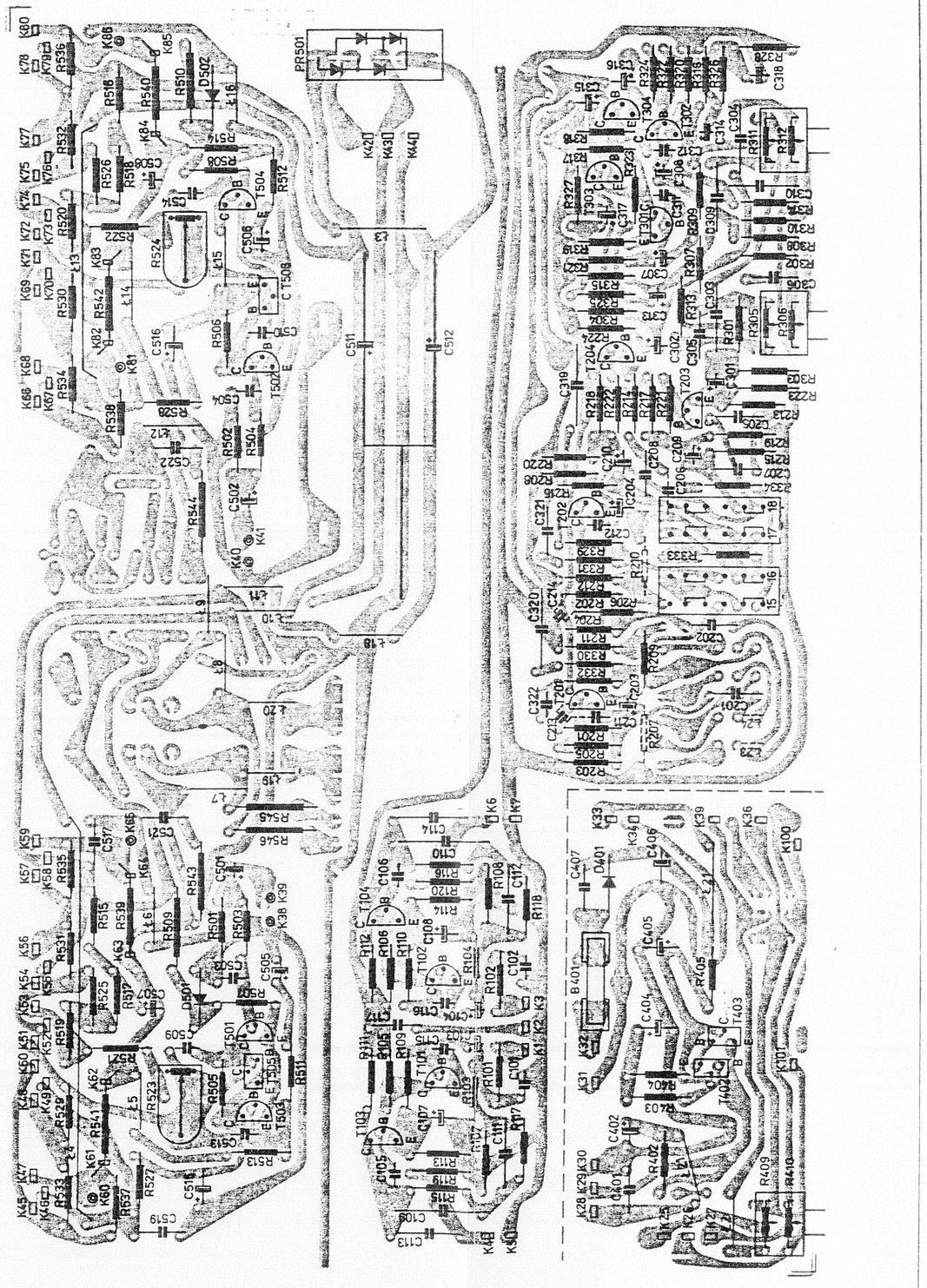
SWITCH INDICATORS P.C.B. 4573-561-1 (2217-566-1)



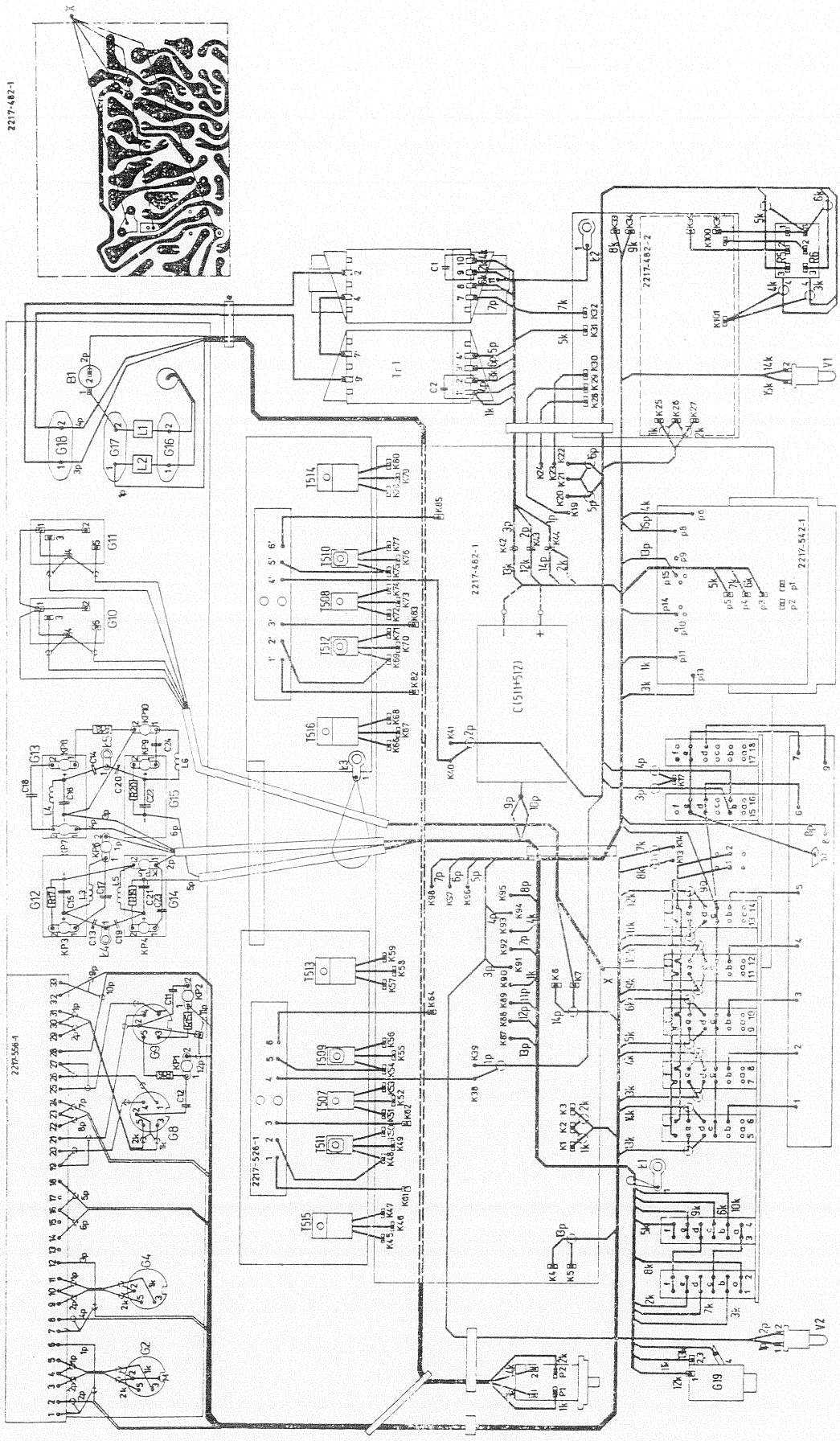
PROTECTION P.C.B. 4573-526-1 (2217-526-1)



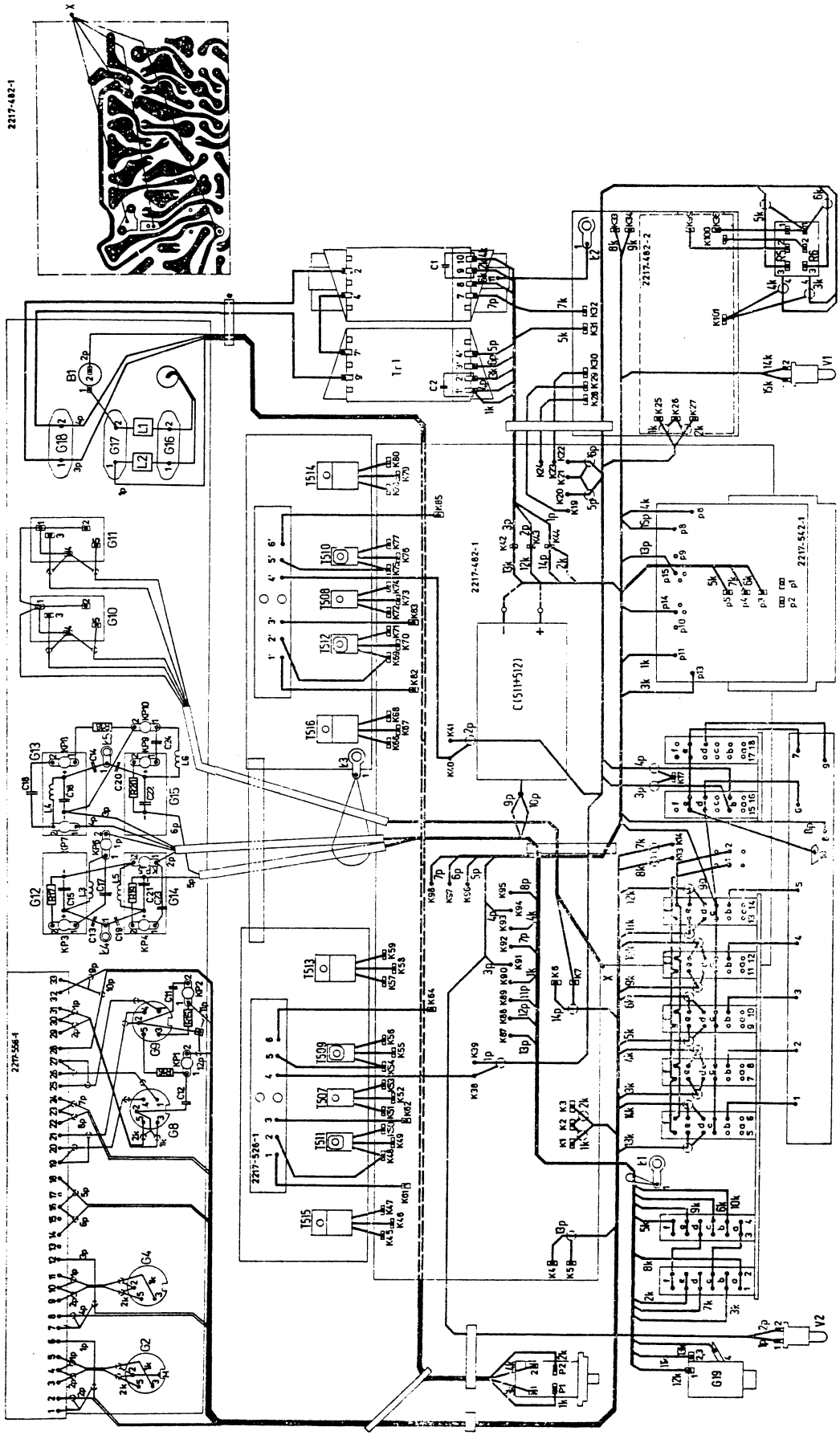
INPUT SOCKETS P.C.B. 4573-549-2 (2217-556-1)



MAIN AMP. P.C.B. 4573-554-11 (2217-482-1/2)



CONNECTION DIAGRAM



CONNECTION DIAGRAM